A NEW LOCALITY FOR *RANUNCULUS INSIGNIS* AND ITS POSSIBLE ORIGIN (NOTE)

D.A. NORTON

Department of Botany, University of Canterbury,
Christchurch, New Zealand

ABSTRACT

A new, isolated location for *Ranunculus insignis* is described, extending the range of this species to Westland. Based on morphological evidence it is suggested that this population originated from populations in the North Canterbury - southern Nelson mountain region through chance dispersal.

Ranunculus insignis Hook.f. is a conspicuous and often abundant plant of mountainous regions occurring in the higher ranges of the North Island, the Nelson mountains and the central and eastern ranges of the South Island, extending to just south of the Rangitata River (Fisher 1965). South of the Spenser Mountains it is rarely found on the Main Divide, and it is confined to the eastern ranges south of the Poulter River headwaters. *R. insignis* typically occurs between 1200 and 1800 m altitude, preferring sites where cool humid conditions prevail. In the South Island steep rocky cliffs and sheltered scrubland, often with a southerly aspect, are favoured.

A population of *Ranunculus insignis* was discovered in the Hokitika River catchment (Westland) in December 1979 (Fig. 1). The population is located approximately one kilometre WSW of Remarkable Peak on the ridge separating Healey Creek (Mikonui River) and Cropp River (Whitcombe River) (NZMS 1, S64 486135). This locality is outside the previously known range of this species, lying 50 km NW of the nearest locality (Mount Catherine, near Lake Heron) on the other side of the Main Divide. The population occurs on a north-facing slope (40°) at about 1700 m. Here *R. insignis* is associated with *Aciphylla monroi* Hook.f., *Celmisia petiolata* Hook.f. and *Marsippospermum gracile* (Hook.f.) Buch. in an open herbaceous community. The area is characterised by exceptionally heavy rainfall (in excess of 12 m per annum) and frequent cloudiness (during the 1979-80 summer the tops were cloud-bound for at least half the time). Gale force NW winds

are common. Snow lies on the ground during the winter months. Biotite schists form the dominant rock type and the soils are alpine gleys.

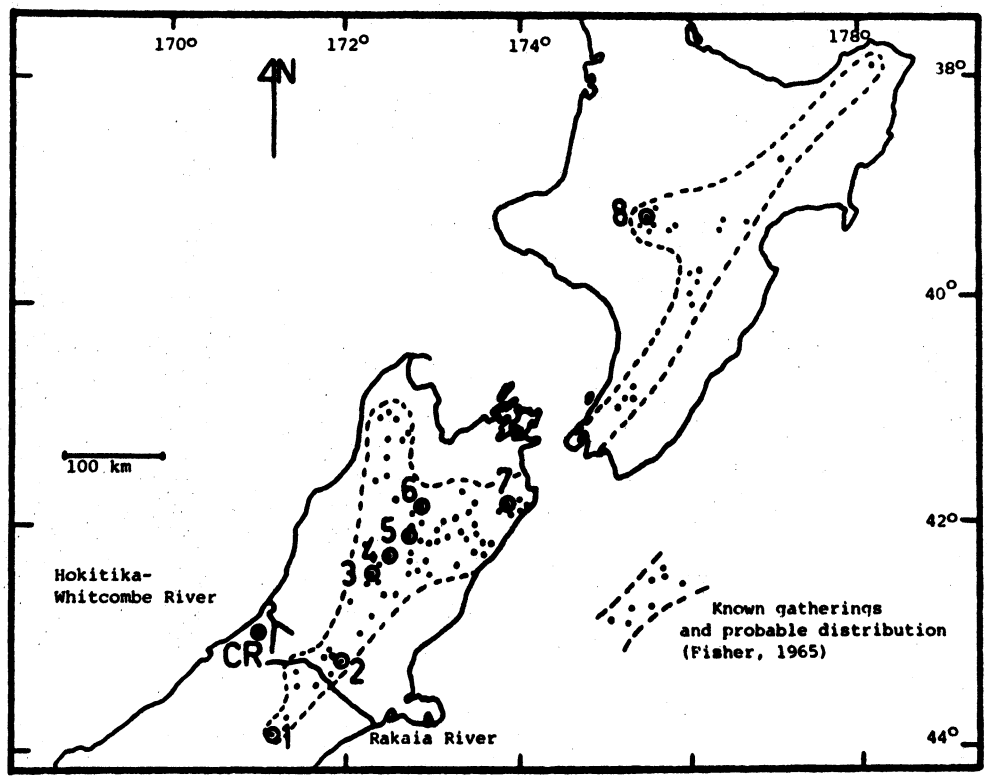

Fig. 1. Distribution of known gatherings of *Ranunculus insignis* and new locality, Cropp River, Westland (CR). 1, Blue Mountains; 2, Mount Torlesse; 3, Amuri Pass; 4, Ada Pass; 5, Mount Dora; 6, Mount St. Arnaud; 7, Mount Monro; 8, Mount Ruapehu.

Fisher (1965) made a detailed study of the New Zealand alpine *Ranunculus* species. His study presented a taxonomic revision and phylogeny of the group and considered variation within and distribution of each species. *R. insignis* had previously been separated into three species and two varieties (Allan 1961). It is now regarded as "a series of incompletely disconnected groups of populations whose average characteristics change, for the most part gradually, from one locality to another" (Fisher 1965, p. 55). A trend from broad leaved, large forms in the north to narrow leaved, small forms in the south is evident, forming an irregular cline. Fisher (1965) studied variation in the *R. insignis* complex using 13 diagnostic characters. Six of these ('leaf proportion', leaf primary

lobing, scape height, number of scape branches, petal number and 'petal proportion') were examined here to determine where the Westland population fits into the *R. insignis* cline. (Table 1) Specimens of the plants examined have been deposited in the University of Canterbury's Department of Botany Herbarium (CANU 26363).

In comparing the results obtained in this study with those of Fisher (1965, see Table 1 this paper) some trends become apparent. Values of several diagnostic characters (notably 'leaf proportion', primary lobing and 'petal proportion') are similar to values obtained from populations in the North Canterbury - southern Nelson mountains (*e.g.* Ada Pass and Mount Dora). Petal number and scape branching values are less similar, being closer to values obtained from several populations in the southern portion of the species' range. Scape height in the Westland population is less than any average value obtained by Fisher for his populations. The distributions of scape heights from different regional samples however, show large numbers of plants with scape heights in the smaller size classes, particularly from populations occurring in the North Canterbury - southern Nelson mountains (Fisher 1965, Table 9).

These results allow some discussion on the origin of this Westland population. This new locality, in a formerly heavily glaciated area (Suggate 1965), could reflect continuing adjustment of the species range after Quaternary glacial disruptions. Expansion and contraction of the range of *Ranunculus insignis* due to climate change has occurred in the past (Burrows 1965, Fisher 1965). Geographically the closest populations of *R. insignis* are those located between the Rakaia and Rangitata Rivers. However, morphologically the closest populations are those of the North Canterbury - southern Nelson mountain region. The Westland population could well have originated from this area. Dispersion to the Cropp River, some 150 km to the SW, would undoubtedly have been a chance event, probably by way of an animal vector. Bird transport seems plausible. On consideration of past glaciation in the area and of the morphological affinities of the Westland *R. insignis* population with more northern populations, it would seem likely that this new population arose through post-glacial colonization from the northern South Island.

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TABLE 1. COMPARISON OF THE CROPP RIVER (WESTLAND) POPULATION OF *RANUNCULUS INSIGNIS* WITH OTHER POPULATIONS (DATA FROM FISHER 1965[1]) USING SIX DIAGNOSTIC CHARACTERS. SAMPLE SIZES AND RANGES FOR THE CROPP RIVER POPULATION ARE GIVEN IN BRACKETS BELOW THE MEAN AND STANDARD DEVIATION RESPECTIVELY.

	Leaf Proportion[2]		Leaf Primary Lobing (number)		Scape Height (cm)		Scape Branching (flower number)		Petal Number		Petal Proportion[3]	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Cropp River	95.1 (11)	11.7 (78.3 - 112.5)	13.6 (8)	1.9 (10-16)	8.4 (4)	1.7 (62-99)	1.2 (5)	0.4 (1-2)	5.0 (4)	0 (5)	83.4 (7)	9.7 (68.4 - 95.0)
Blue Mountains	61	-	9.3	-	15.1	-	2.3	-	5.5	-	63	-
Mount Torlesse	63.2	10.3	8.4	2.1	14.0	4.2	1.4	0.6	5.4	0.7	60	-
Amuri Pass	79.2	15.4	10.3	1.5	12.9	4.8	1.3	0.6	5.7	0.9	67	-
Ada Pass	89.7	16.2	10.5	2.1	11.4	6.3	1.4	1.0	6.1	1.7	75	-
Mount Dora	139.9	17.2	14.6	3.1	23.0	11.4	3.9	2.9	6.0	3.0	84	-
Mount St. Arnaud	161.5	23.5	14.0	3.4	21.8	45.7	3.0	0.7	6.0	1.4	81	-
Mount Monro	108.2	16.5	12.0	2.8	52.4	7.6	3.3	2.5	7.3	2.1	75	-
Mount Ruapehu	130.1	20.1	17.6	4.2	30.1	6.1	6.5	5.2	6.0	1.5	83	-

FOOTNOTES:

[1] See Fig. 1 for location of these populations.

[2] Leaf proportion = $\frac{\text{lamina width} \times 100}{\text{length from petiole}}$

[3] Petal proportion = $\frac{\text{width} \times 100}{\text{length from base of gland}}$

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